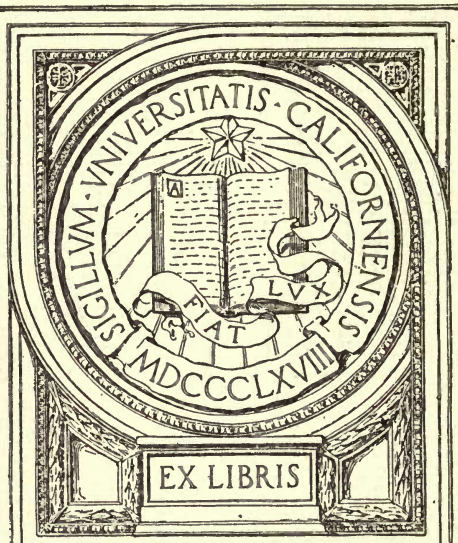
QC
990
J4K3

GIFT OF



L 432
N16

GIFT
AV 11 92

RÉSUMÉ

OF

OBSERVATIONS

MADE AT THE

KANAYAMA METEOROLOGICAL STATION,

KANAYAMA, JAPAN

FOR THE 20 YEARS

1898 to 1917,

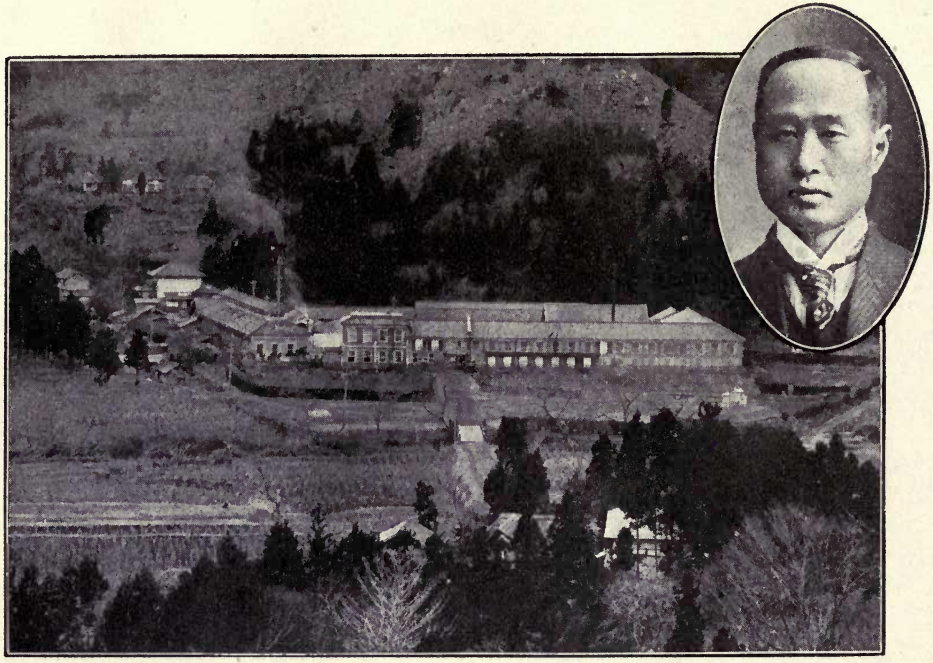
UNDER THE DIRECTION OF

R. SANO.

LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA

TOKIO:
PUBLISHED BY THE STATION.
1919.

UNIV. OF
CALIFORNIA



Sano Silk filature and Meteorological station. Mr. R. Sano. Director.

DO NOT
REMOVE

QC990
J4K3

CP

INTRODUCTION.

The present pamphlet contains the résumé of observations made at the Kanayama Meteorological Station during the twenty years* from 1898 to 1917. The results of six-daily observations are published in extenso in the Monthly and Annual Reports of the Central Meteorological Observatory, Tokio.

The Meteorological Station was established in the December of 1897, and tri-daily observations were made at 6 am, 2 pm and 10 pm since the first of January, 1898. In 1899 six-daily observations were began, and the government sanction was obtained to make the mutual exchange of daily weather telegrams with the Central Observatory.

Kanayama is a small town not far from Sendai, largest city in Northeastern Japan. The Station is situated at the end of the town and has the geographical coordinates, 140° 46′ e. g. and 37° 53′ n. The

University Observatory (design).

* In 1917 the Kanayama meteorological station celebrated the 20th aniversary of its foundation. On that occasion Mr. R. Sano, Director made a donation of 1150 yens for the fund of Sano Medal, and that of 1000 yens for publishing a treatise on theoretical meteorology to the Meteorological Society of Japan. The medal shall be awarded for distinguished service done in connection with meteorology of Japan. He also presented a building of Meteorological observatory to the Tôhoku Imperial University, Sendai. The building is under construction, and the total cost of it is estimated to amount to 20000 yens.

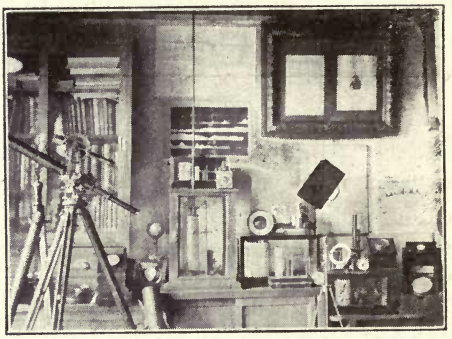
478647

average height of the ground is about 25 metres above mean sea level.

I. Building and equipment.

The meteorological station occupies a building erected for it in the compound of the silk filature belonging to the proprietor and director of the station. The building contains three apartments for the director, observers and servants. There is also a special building for seismometric observations.

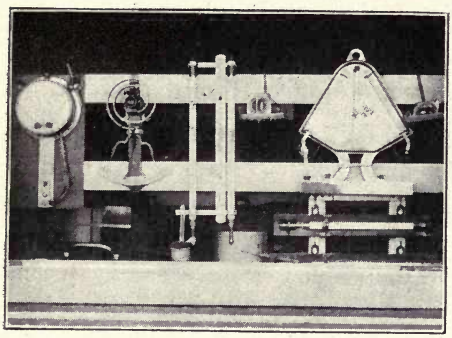
The normal barometer in use at the station is of the Fortin pattern and was made by Mr. Suzuki, instrument-maker in Tokio. It is installed in a room in a corner of the observers' apartment. The height of the cistern is 24.6 metres above mean sea level. In the same room there is also a Richard barograph for recording the change of atmospheric pressure.



Observers' apartment.

Wet and dry bulb thermometers, maximum and minimum thermometers are set in a thermometer screen which stands in the observation garden in front of the station building. All these thermometers were con-

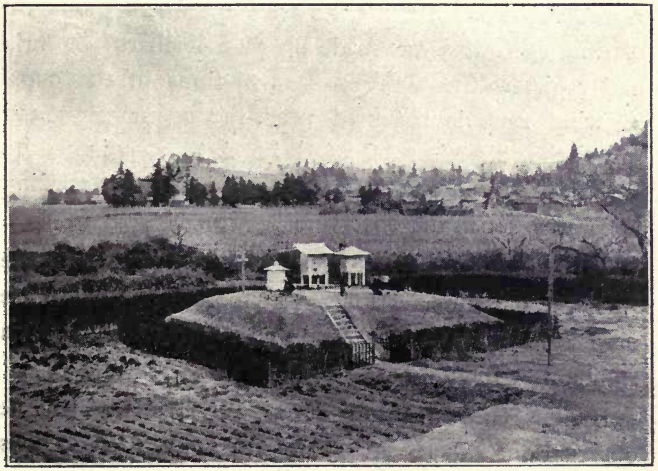
structed by Mr. R. Fuess, well known German mechanician. A thermograph and a hygrograph made by Jule Richard of Paris are also set in the same screen.



Thermometer screen (inside.)

A rain-gauge having 20 centimetres in diameter is set in the garden. A self-recording pluviometer of the Hellmann pattern is installed near the thermometer screen.

An evaporimeter is placed near the rain-gauge, at the same level with the latter. Another evaporimeter



Observation garden.

of similar size and construction is set in a screen for measuring the amount of evaporation in shade.

A sunshine recorder of Jordan's pattern is installed on the solid pillar erected in a corner of the garden.

Earth-thermometers for measuring the underground temperatures at different depths are set in the garden. For the depth below 10 centimetres a mercurial thermometer with a long stem is used. But the temperature of a deeper layer of the ground is measured by means of a mercurial thermometer suspended in an iron tube driven into the soil to the required depth. The thermometer is partly enclosed in wooden frame and its bulb is also partly enveloped by a thin piece of india-rubber so as to render it insensible to sudden change of temperature when the thermometer is drawn out of the tube for reading. On the roof of the building is set a Robinson cup anemometer which is in connection with an electric recorder placed in the observer's apartment. The recording apparatus was made by Jule Richard of Paris and registers the number of revolutions of the cups. A wind vane is mounted near the anemometer and gives the direction of wind in sixteen points. Its variations is mechanically recorded by a recording apparatus set in the observers' apartment.

The forms of clouds are observed according to the International classification. The motion of clouds are observed by means of Besson's comb nephoscope which stands near the garden.

Besides these instruments in use for daily routine observations, there are spare instruments of various kinds. Many of them are in good working order.

All the instruments were carefully tested by the Central Meteorological Observatory, Tokio, and their instrumental errors were determined.

Observations and their reductions are made in accordance to the Instructions issued by the Central Observatory.

The hours of observation are 2 am, 6 am, 10 am, 2 pm, 6 pm, and 10 pm of the 135th meridian or the central standard time of Japan. During the visitation of a severe storm extra observations are taken, at least, every hour.

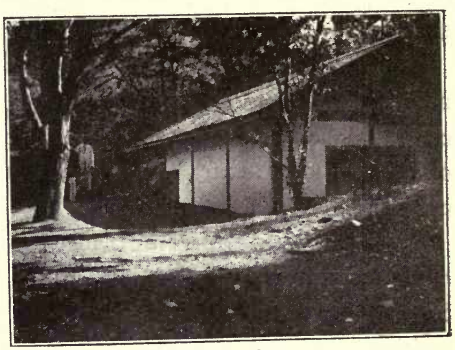
The time is kept by a chronometer, its daily correction being found at 9 o'clock every night by noting wireless time-signals sent from the Astronomical Observatory, Tokio. For this purpose an aerial fitted with a receiving apparatus is installed at the neighbourhood of the station building.

II. Maintenance and Personnel.

The expenses of the station are paid by Mr. R. Sano, director and proprietor. The staff consists of one director and four observers, including Mr. M. Hatta, former chief of the meteorological station at Fusan, Korea and Mr. Sakurai, an observer of long experiences. Two servants and one mechanician are also employed. All the observers and employes have their homes in the compound of the Sano silk filature to which the meteorological station belongs. The dwelling houses are provided for them by the proprietor of the station.

III. Seismological observations.

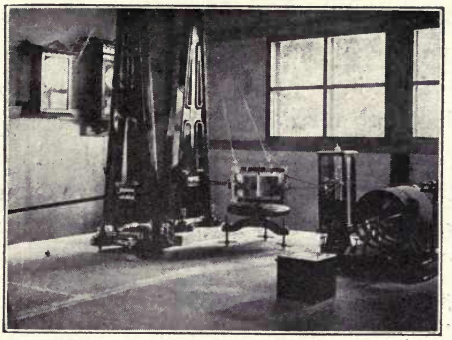
For recording local as well as distant earthquakes a pair of the horizontal pendulum seismometers is installed in a half underground room. In constructing the seismometer room a special precaution was taken so as to prevent sudden changes of air temperature in the room.



Seismometer house.

The seismometers were constructed upon design of Professor F. Omori of the Imperial University of Tokio. The bob of pendulum is a flat brass cylinder, filled with lead. It is attached to a long tubular strut terminating in a sharp conical point, which is pivoted in a cavity on the main column. The bob is stayed by the thin steel wires which are attached in a stirrup controlled by adjusting screws which regulate the height of the bob. The long arm of the writing pointer presses lightly on the smoked paper wound round on the revolving drum which has a horizontal sliding motion upon its axle. The time-ticker which is in electric connection with a good clock marks minutes upon the trace of the pointer.

One of the seismometers is installed so as to record the north-south component of earthquake motion and



Omori's seismometers.

the other the west-east component. The constants of both pendulums are as follows :

Component	Multiplication ratio	Period of vibration (sec).	Weight of the bob. (kgm)
E–W	20	11	14.3
N–S	50	16	52.7

IV. Local Weather Forecasts.

The station sends daily the weather telegram containing the following items :— readings of the barometer reduced to sea level and to standard gravity ; air temperature ; direction and speed of wind ; forms and amount of clouds ; rainfall ; state of sky and so forth observed at 6 o'clock in the morning to the Central Meteorological Observatory, Tokio.

The station receives daily synoptic reports from the Tokio Observatory, and issues local weather forecasts covering a period of thirty-six hours from the time of

observation. These forecasts are chiefly based upon the synoptic report of the Central Observatory, but the records of the instruments at the station are to be carefully taken into consideration. In late spring special warnings are issued when killing frost is expected.

All the meteorological telegrams which are daily exchanged between this station and the Central Meteorological Observatory of Tokio are transmitted free of charge by the sanction of the Department of Communications.

Table I. Barometric pressure. (in mm.) *

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	—	757.6	761.1	761.6	755.7	755.4	755.6	756.3	757.8	760.8	763.0	759.0	—
1899	758.8	762.5	759.4	759.9	758.6	755.9	753.8	756.9	759.9	759.4	761.0	760.7	758.9
1900	761.5	760.9	759.8	760.9	755.2	757.4	754.0	756.8	758.7	762.7	762.2	761.1	759.3
1901	762.6	756.0	761.1	761.5	757.4	754.7	755.0	757.1	757.2	761.2	760.1	759.8	758.6
1902	759.0	762.4	760.4	758.2	757.5	754.6	754.6	757.5	757.2	762.6	763.6	759.3	758.9
1903	760.7	760.8	762.3	761.4	758.0	754.2	754.8	757.2	759.4	761.4	761.4	759.5	759.3
1904	760.6	762.3	761.4	762.1	757.6	755.5	755.6	757.0	757.2	760.8	759.2	760.0	759.1
1905	759.6	758.5	764.3	760.2	758.2	755.4	756.1	756.1	759.3	761.8	763.4	761.3	759.5
1906	760.5	759.1	758.9	757.9	758.2	756.6	753.9	755.5	758.9	761.5	763.6	757.9	758.5
1907	761.9	759.9	760.7	760.8	755.1	755.4	756.1	755.2	759.2	761.3	763.1	759.7	759.0
1908	762.3	760.4	760.8	761.3	757.8	755.2	755.9	757.2	760.0	761.1	758.4	761.0	759.3
1909	762.2	758.6	762.6	759.4	757.3	755.5	758.0	756.0	757.9	760.8	761.1	761.4	759.2
1910	760.2	757.3	759.0	760.7	758.5	754.8	755.6	755.4	758.3	762.5	761.4	760.8	758.7
1911	762.3	763.3	760.8	757.8	759.7	755.3	755.8	756.8	759.7	759.2	762.4	762.3	759.6
1912	760.6	760.1	759.6	758.9	757.3	754.4	754.5	757.4	758.0	762.2	761.8	764.0	759.1
1913	761.2	759.8	759.2	760.4	756.1	754.1	755.4	754.0	758.6	760.5	763.8	760.4	758.6
1914	760.0	761.8	761.2	757.8	758.8	755.3	754.3	755.9	759.8	761.7	762.5	759.6	759.1
1915	761.8	759.3	758.7	760.1	757.1	756.4	756.0	753.6	759.0	760.6	764.7	760.3	759.0
1916	761.6	759.1	758.7	761.0	758.0	756.1	756.0	755.5	759.0	762.8	765.1	761.1	759.5
1917	757.5	756.5	760.6	757.5	755.3	755.5	756.9	756.1	759.7	760.4	760.6	755.7	757.7
Mean	760.8	759.8	760.5	758.0	757.4	755.4	755.4	756.2	758.8	761.3	762.1	760.3	758.9

* Reduced to freezing point only.

Table II. Mean air temperature. (in °C.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	2.1	1.8	1.6	8.2	14.3	17.1	23.9	24.4	19.2	12.5	8.5	4.4	11.5
1899	1.2	1.5	5.1	9.8	15.4	19.1	21.2	24.0	17.9	12.2	6.6	2.9	11.4
1900	−1.6	0.0	3.0	8.5	15.4	16.8	20.7	24.4	20.2	13.4	7.7	3.1	11.0
1901	1.5	0.7	3.7	10.2	13.9	18.3	20.3	23.6	20.0	14.1	7.5	2.2	11.3
1902	0.2	0.8	5.1	8.8	14.1	18.1	19.5	20.4	20.2	13.6	8.2	5.5	11.2
1903	2.4	2.2	5.1	10.8	13.9	17.8	21.5	23.0	20.6	12.9	7.1	1.7	11.6
1904	−0.4	1.6	3.3	9.8	13.2	20.1	22.6	23.1	18.7	13.5	6.7	3.8	11.3
1905	2.3	−0.4	3.1	7.6	14.6	18.1	21.5	19.6	19.3	14.1	6.6	4.4	10.9
1906	−0.8	−0.5	4.2	10.0	14.3	15.8	21.4	22.0	17.5	12.7	6.4	4.1	10.6
1907	0.6	−0.2	3.3	9.2	14.7	17.7	20.4	24.5	19.1	12.5	8.5	1.7	11.0
1908	0.1	0.1	3.1	8.9	13.7	17.9	20.1	24.4	17.1	12.4	6.1	3.1	10.6
1909	−1.5	−0.8	2.1	10.8	14.5	18.1	23.2	22.7	20.0	12.0	7.8	2.1	10.9
1910	1.7	0.2	3.0	9.4	14.2	18.9	21.1	22.4	18.9	13.8	7.8	0.9	11.0
1911	−0.7	2.4	4.9	10.6	14.4	19.3	22.7	23.7	20.3	13.5	9.9	2.6	12.0
1912	0.8	3.2	4.3	10.6	13.4	17.5	21.2	22.7	18.0	12.8	6.4	1.9	11.1
1913	−0.1	1.3	2.9	11.1	13.4	17.3	20.1	21.0	17.4	12.7	7.4	3.3	10.6
1914	2.5	1.4	6.1	8.6	15.3	19.1	23.1	23.7	20.4	12.8	9.9	3.6	12.2
1915	−0.3	1.0	3.1	8.8	12.5	20.1	21.6	23.6	20.1	15.6	7.9	3.8	11.5
1916	2.9	1.0	2.7	8.9	14.0	20.9	21.6	23.0	21.0	14.1	8.3	3.7	11.8
1917	1.0	1.6	4.1	9.7	13.4	17.7	23.7	22.6	19.9	14.7	6.1	2.8	11.4
Mean	0.7	0.9	3.7	9.5	14.1	18.3	21.6	22.9	19.3	13.3	7.6	3.1	11.3

Table III. Mean maximum temperature. (in °C.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	6.1	5.8	6.1	14.6	20.2	21.6	29.0	28.8	24.0	20.0	14.1	9.1	16.6
1899	6.0	6.4	10.3	16.3	22.0	23.6	24.8	28.8	22.5	18.2	12.7	8.0	16.6
1900	2.8	4.3	7.9	14.1	21.5	21.7	24.6	29.1	25.4	19.6	15.1	7.9	16.2
1901	6.0	5.8	9.4	15.7	19.1	22.6	23.6	28.1	24.6	19.4	13.5	8.0	16.3
1902	5.1	6.5	11.2	14.1	19.5	22.6	23.2	23.8	24.2	19.4	15.1	10.1	16.2
1903	6.7	7.1	10.1	16.3	19.1	22.2	25.7	27.8	24.6	17.8	12.9	5.8	16.4
1904	3.6	6.8	7.9	15.3	18.6	25.2	26.7	27.6	23.5	18.3	13.0	8.7	16.3
1905	7.1	3.8	7.9	12.6	20.4	22.1	25.7	22.8	24.3	19.7	13.6	9.4	15.8
1906	3.9	3.0	9.0	15.7	19.8	20.0	24.6	25.8	22.6	18.2	11.8	9.1	15.3
1907	5.7	5.0	8.4	14.9	20.6	21.9	24.8	28.3	23.7	19.0	14.0	6.4	16.1
1908	4.4	4.8	7.7	14.6	19.1	22.1	23.6	29.2	21.4	18.6	12.1	8.0	15.5
1909	3.1	4.3	6.6	17.4	19.0	21.5	27.3	26.8	23.8	17.8	14.8	7.1	15.8
1910	6.6	4.4	8.7	15.8	20.0	23.8	25.0	26.2	23.8	18.8	14.3	6.2	16.1
1911	4.1	7.0	10.1	16.1	20.3	23.7	26.8	27.6	24.8	19.0	15.6	8.0	16.9
1912	5.3	8.3	9.2	16.8	18.9	21.1	24.6	26.4	22.0	18.6	11.6	6.4	15.8
1913	4.5	5.9	7.8	17.4	18.9	21.7	23.6	25.3	22.7	17.8	13.2	7.9	15.6
1914	8.0	6.4	11.4	14.1	20.9	23.6	27.3	27.9	25.1	19.4	16.0	8.8	17.4
1915	4.9	5.2	7.9	14.2	18.0	24.7	26.0	27.1	24.0	20.1	14.4	10.0	16.4
1916	7.7	5.6	7.9	14.2	19.7	26.0	24.8	26.4	25.3	18.0	14.3	8.6	16.5
1917	5.4	6.0	8.4	15.6	19.6	21.9	28.7	27.0	23.5	19.3	11.2	7.2	16.1
Mean	5.4	5.6	8.7	12.3	19,8	22.7	25.5	27.0	26.8	18.9	13.7	8.0	16.2

Table IV. Mean minimum temperature. (in °C.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	−2.5	−2.2	−3.0	2.0	8.6	12.9	19.9	21.2	15.9	6.9	3.2	0.1	6.9
1899	−3.8	−2.8	0.1	4.3	9.8	14.9	18.7	20.6	14.7	7.5	1.1	−1.5	7.0
1900	−6.3	−4.5	−1.5	2.9	9.2	11.6	16.3	20.3	15.9	7.4	1.8	−1.4	6.0
1901	−2.9	−4.3	−2.2	4.5	8.3	13.9	17.2	19.2	15.7	8.9	1.7	−2.9	6.4
1902	−4.5	−4.6	−0.6	2.4	8.1	13.5	16.1	17.4	16.6	8.2	1.9	1.1	6.3
1903	−1.8	−2.8	0.3	4.8	8.3	13.2	17.4	18.1	16.9	8.2	1.8	−2.4	6.8
1904	−4.6	−3.1	−0.9	5.0	7.7	15.3	19.0	19.1	14.6	9.2	0.6	−0.4	6.8
1905	−2.1	−4.4	−1.6	2.5	8.7	14.5	17.8	17.1	15.1	9.6	1.1	−0.1	6.5
1906	−5.2	−3.8	0.0	4.2	8.0	11.8	18.6	18.6	13.1	7.9	1.2	−1.1	6.1
1907	−4.4	−4.9	−1.9	3.6	8.4	13.2	16.1	20.8	15.5	7.2	3.7	−2.6	6.2
1908	−4.1	−4.1	−0.9	3.7	8.6	13.5	17.1	20.6	13.4	6.9	0.6	−1.5	6.1
1909	−6.2	−5.5	−1.8	4.6	10.0	14.8	18.9	19.2	16.5	6.6	1.4	−2.3	6.3
1910	−2.8	−3.3	−2.2	3.0	9.0	14.4	17.9	19.4	15.2	10.1	2.5	−3.4	6.6
1911	−4.9	−2.2	0.2	5.4	7.7	15.1	18.9	20.4	16.0	8.6	4.3	−2.2	7.3
1912	−3.5	−1.3	−0.3	4.5	7.9	14.2	18.0	19.8	14.4	7.8	1.9	−2.4	6.8
1913	−4.4	−3.1	−1.8	4.9	8.4	12.8	17.4	17.2	12.9	8.0	1.6	−1.3	6.0
1914	−2.6	−3.3	1.2	3.1	9.8	15.0	19.5	20.3	16.8	7.5	4.0	−1.2	7.5
1915	−5.4	−2.8	−1.0	4.1	7.5	15.7	18.0	20.4	16.5	11.1	2.3	−1.5	7.1
1916	−1.9	−2.8	−2.0	3.7	8.6	16.7	18.8	19.9	17.7	10.4	3.2	−0.8	7.6
1917	−3.2	−2.7	−1.1	4.1	6.7	13.9	19.6	18.8	17.0	10.6	1.2	−1.8	7.0
Mean	−4.1	−3.4	−1.1	3.9	8.5	14.0	18.1	19.4	15.5	8.4	2.1	−1.5	6.7

Table V. Tension of aqueous vapour. (in mm.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	3.5	3.6	3.4	5.3	7.8	11.8	17.7	19.6	14.4	7.0	5.2	3.7	8.6
1899	3.3	3.5	4.0	6.0	9.2	12 6	16.5	18.0	13.0	8.0	4.9	3.9	8.6
1900	2.9	3.0	3.8	6.0	8.8	11.1	15.0	19.1	14.9	9.4	6.2	4.1	8.7
1901	3.7	3.5	4.0	6.7	8.3	12.8	15.5	17.9	14.6	10.0	5.8	3.8	8.9
1902	3.0	3.2	4.4	5.0	8.3	11.7	14.5	15.9	15.4	9.6	6.4	4.9	8.5
1903	4.2	3.5	4.7	7.0	8.4	11.6	16.0	17.0	15.5	9.6	5.7	3.7	8.9
1904	3.0	3.5	3.9	6.9	8.3	13.3	17.3	17.9	13.5	9.7	5.2	4.2	8.9
1905	3.9	2.8	3.8	5.3	8.7	13.2	15.8	15.0	13.8	9.9	5.6	4.7	8.5
1906	3.0	3.3	4.1	5.8	7.8	10.7	17.1	17.2	12.5	9.0	5.2	4.2	8.3
1907	3.5	3.1	3.9	6.1	8.6	11.6	15.1	19.8	14.3	8.4	6.3	3.6	8.7
1908	3.2	3.1	4.0	6.0	8.3	12.1	15.0	19.1	12.1	8.6	4.9	3.7	8.3
1909	3.1	2.9	3.7	6.9	9.1	12.9	16.3	17.7	14.6	8.0	5.5	3.8	8.7
1910	3.8	3.0	3.6	5.8	8.8	12.7	15.9	17.6	13.8	10.2	5.9	3.6	8.7
1911	3.2	3.4	4.5	6.8	8.4	13.1	16.6	18.5	15.0	9.2	6.9	4.0	9.1
1912	3.4	4.2	4.1	5.8	8.6	12.4	15.9	18.3	13.1	9.1	5.4	4.0	8.7
1913	3.2	3.3	3.6	6.7	8.0	11.3	15.2	15.4	12.1	9.2	5.3	4.4	8.1
1914	3.6	3.5	5.0	5.6	9.5	12.5	16.7	18.4	15.0	8.9	6.9	4.3	9.2
1915	3.4	3.7	4.0	5.9	7.9	14.4	15.7	18.5	15.2	10.9	6.2	4.3	9.2
1916	4.1	3.8	3.7	5.8	8.7	14.7	16.9	18.6	16.0	9.9	6.5	4.7	9.4
1917	3.4	3.5	4.2	5.9	7.7	12.3	17.5	17.2	15.4	10.4	5.2	3.8	8.9
Mean	3.4	3.4	4.0	6.1	8.5	12.4	16.1	17.8	14.2	9.3	5.8	4.1	8.7

Table VI. Relative humidity. (%)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	67	70	66	67	66	81	82	87	86	66	63	59	72
1899	67	71	62	68	73	78	88	83	86	77	68	71	74
1900	72	67	69	73	69	78	84	85	84	82	79	72	76
1901	73	73	68	73	72	82	87	83	82	82	75	72	77
1902	66	68	68	61	70	77	86	89	87	82	80	72	76
1903	78	68	72	73	72	78	84	82	86	85	85	72	77
1904	68	69	68	77	75	77	86	86	84	82	72	71	76
1905	73	65	67	69	71	85	83	89	82	83	77	75	77
1906	70	76	67	64	66	81	89	87	84	83	72	69	76
1907	74	70	67	70	70	77	85	87	86	78	76	70	76
1908	71	67	71	71	73	80	85	85	84	81	70	65	75
1909	75	69	71	71	74	84	79	87	83	76	70	71	76
1910	74	66	63	66	73	79	85	87	84	87	74	74	76
1911	75	64	70	72	71	80	82	85	85	79	75	73	76
1912	70	73	68	61	75	84	85	89	85	82	74	76	77
1913	70	66	65	69	71	78	87	84	82	83	70	77	75
1914	68	70	70	67	76	77	80	85	83	81	74	75	76
1915	77	75	71	71	75	82	82	86	87	81	78	71	78
1916	72	77	68	68	74	81	88	90	86	83	79	78	79
1917	71	71	70	67	69	80	82	85	90	83	74	70	76
Mean	71.6	69.8	68.1	68.9	71.8	80.0	84.5	86.1	84.8	80.8	74.3	71.7	76.1

Table VII. Amount of clouds.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	6.1	6.7	7.3	6.6	7.4	8.4	8.1	8.8	8.3	5.4	6.2	6.7	7.2
1899	5.8	6.8	6.7	6.5	7.6	8.2	9.4	8.1	8.5	6.0	5.6	5.0	7.0
1900	5.9	5.7	6.4	6.0	6.8	7.2	7.9	6.6	7.6	6.6	5.4	6.2	6.5
1901	6.1	5.5	6.3	6.5	7.1	7.8	9.0	8.2	7.4	6.8	5.4	4.7	6.7
1902	4.6	5.3	6.2	6.1	7.5	7.4	8.8	9.3	8.3	6.5	5.4	5.5	6.7
1903	6.6	5.6	7.7	6.8	7.5	7.7	8.8	6.7	8 2	7.5	5.5	5.7	7.0
1904	4.5	5.3	6.6	8.0	7.1	8.2	8.4	6.7	8.0	8.1	5.1	5.4	6.8
1905	5.5	5.2	6.0	7.7	6.6	8.7	8.2	9.4	7.3	7.3	5.2	6.1	6.9
1906	5.3	6.8	6.4	5.8	6.9	8.0	9.0	8.2	8.0	7.2	5.5	5.1	6.8
1907	5.7	5.9	6.6	5.8	6.4	7.3	7.4	6.8	7.4	5.7	6.4	3.8	6.3
1908	5.7	5.4	6.1	6.7	6.6	7.4	8.9	6.8	8.6	6.3	5.7	4.6	6.6
1909	6.4	5.3	6.6	6.7	7.1	8,9	7.4	7.5	8.3	6.2	4.2	4.9	6.6
1910	6.7	5.6	5.9	5.6	7.3	7.7	9.2	9.2	8.6	8.0	4.3	5.3	7.0
1911	5.2	4 1	6.2	6 3	5.5	7.8	8.4	7.8	7.5	6.7	5.3	4.3	6.3
1912	4.6	5.8	6.2	6,2	6.8	9.0	8.7	8.3	7 9	6.6	5.5	5.9	6.8
1913	4.4	5.1	5.0	7.3	7.1	8.2	9.2	7.6	7.2	6.8	4.4	5.5	6.5
1914	4.2	5.6	6.4	6.1	7.4	8.4	8.1	7.5	7.1	5.6	5.2	5.5	6.4
1915	5.9	6.2	6.1	7.4	7.1	7,9	7,8	8.5	8.0	6.9	5.2	4.2	6.8
1916	5.3	5.7	5.5	7.2	7.3	7.9	9.0	7.9	7.9	8.0	5.5	5.3	6.9
1917	5.1	5.1	6.6	6.7	6.3	8.1	7.1	8.0	8.9	7.5	5.4	4.9	6.7
Mean	5.5	5.6	6.3	6.6	7.0	8.0	8.4	7.9	7.9	6.8	5.3	5.2	6.7

Table VIII. Number of clear days.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	3	0	1	5	0	1	0	0	0	5	3	3	21
1899	3	2	1	4	1	1	0	3	1	4	1	6	27
1900	0	2	3	6	3	2	0	3	1	4	5	0	29
1901	2	1	3	3	2	3	0	0	1	4	5	7	31
1902	8	3	1	2	0	4	0	0	2	4	5	1	30
1903	1	1	1	4	0	0	0	1	2	1	4	2	17
1904	2	3	1	1	2	0	0	2	1	0	4	5	21
1905	4	2	4	0	1	0	0	0	2	1	5	3	22
1906	4	1	3	4	1	1	0	0	0	1	2	3	20
1907	5	0	1	3	2	3	3	3	1	2	4	7	34
1908	1	2	7	4	4	2	0	1	0	2	2	5	30
1909	1	3	2	3	4	0	1	1	1	3	9	4	32
1910	1	1	1	7	2	1	0	0	1	0	8	2	24
1911	4	4	3	3	5	0	2	1	2	2	7	3	36
1912	2	4	4	3	3	0	0	0	0	3	3	4	26
1913	5	4	5	3	2	0	0	3	3	3	6	2	36
1914	5	2	4	4	3	0	0	2	3	6	7	3	39
1915	0	1	3	0	1	1	0	1	0	2	1	8	18
1916	5	2	1	1	1	1	0	0	0	1	7	4	23
1917	1	3	2	3	1	0	1	2	0	3	1	3	20
Mean	2.9	2.1	2.6	3.2	1.9	1.0	0.4	1.2	1.1	2.6	4.5	3.8	26.8

Table IX. Velocity of wind (in m/s.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	—	2.3	3.5	2.8	3.1	2.1	2.0	1.9	1.8	1.9	1.8	2.2	—
1899	2.8	2.6	3.6	2.6	2.0	2.0	1.2	1.5	1.3	2.2	2.2	2.5	2.2
1900	2.1	2.6	2.7	2.5	2.7	2.1	1.8	1.8	1.2	1.3	1.6	2.0	2.0
1901	2.3	2.3	2.8	2.5	2.2	2.0	1.5	1.6	1.6	1.5	2.0	2.1	2.0
1902	3.1	2.5	2.6	3.4	2.8	2.2	1.6	1.1	1.7	1.4	1.2	2.3	2.2
1903	1.8	2.2	2.0	1.8	2.5	2.1	1.5	1.5	1.4	1.3	1.9	1.8	1.8
1904	1.9	2 0	2.5	1.9	1.9	1.8	1.7	1.5	1.4	1.4	2.1	2.3	1.9
1905	2.0	3.1	2.1	2.4	1.9	1.7	1.5	1.5	1.5	1.5	1.6	1.9	1.9
1906	2.4	2 0	2.9	3.0	2.6	1.9	1.7	1.4	1 2	1.6	2.1	2.3	2.1
1907	1.7	2.0	2.4	2.7	2.4	2.1	1 7	2.4	1.2	1.6	1.6	2.9	2.1
1908	1.8	2.4	2.6	1.9	1.8	1.6	1.3	1.5	1.1	1.1	1.9	2.6	1.8
1909	1.6	2.4	1.9	2.0	2.0	1.8	1.5	1.3	1.2	1.5	2.1	2.0	1.8
1910	1.9	3.1	2 9	2.2	1.8	1.6	1.5	2 2	0.9	1.0	1.6	1.5	1.9
1911	2.0	3.3	2.6	2.6	2.1	2.0	1.9	1.7	1.4	1.7	1.9	2.3	2.1
1912	2.7	2.7	3.5	3.4	2.2	1.9	1.3	1.4	1.8	1.4	2.1	1.9	2.2
1913	2.6	2.7	2.9	2.4	2.3	2.0	1.5	1.7	1.5	1.5	2.4	2.1	2.1
1914	2.7	2.3	2.7	3.2	2.1	2.0	1.9	2.0	1.6	1.6	1.8	2.0	2.2
1915	2.4	2.5	3.4	2.8	2.7	2.0	1.9	1.8	1.6	1.9	1.7	2.6	2.3
1916	2.7	2.3	3.0	2.8	2.6	2.1	2.1	1.5	1.3	1.5	1.6	2.0	2.1
1917	2.4	2.7	2.9	2.9	2.4	2.0	1.8	1.4	1.0	1.9	2.1	2.4	2.2
Mean	2.3	2.5	2.8	2.6	2.3	2.0	1.6	1.6	1.4	1.5	1.9	2.2	2.0

Table X. Mean direction of wind.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	N 87°W	S61°W	S85°W	S34°W	S67°W	S 57°E	SE	S 31°E	S 29°E	S 9°E	N 44°W	N 67°W	S44°W
1899	N 77°W	N45°W	N 56°W	N 64°W	N84°E	N37°W	S 83°E	S	N 75°E	N55°W	N 64°W	N 70°W	N58°W
1900	N 65°W	N64°W	N 79°W	N 40°W	S89°W	S 47°E	S 52°E	S 57°E	N 12°W	N 64°W	N 68°W	N 80°W	N74°W
1901	N 53°W	N 76°W	N72°W	S 36°E	N 1°W	S 84°E	N 87°E	N 61°E	N 39°W	N 27°W	N 63°W	N 61°W	N43°W
1902	N 65°W	N 75°W	N 73°W	N54°W	N44°W	S 63°E	N 47°E	N 17°E	N 50°E	N 25°W	N 49°W	N 64°W	N52°W
1903	N61°W	N 64°W	N49°W	N 83°E	N14°W	S 84°E	N 32°E	S 68°E	N 29°E	N 75°W	N 59°W	N 71°W	N51°W
1904	N64°W	N61°W	N49°W	N 2°E	N25°E	S69°W	S 82°E	N 49°E	N 13°W	N 27°W	N 51°W	N 46°W	N33°W
1905	N54°W	N 53°W	N63°W	N49°W	S89°W	N 25°E	S 88°E	N 47°E	N 38°E	N 21°E	N 2°W	N 42°W	N17°W
1906	N45°W	N52°W	N42°W	N12°W	N 12°E	N60°E	N 59°E	N 60°E	N 4°E	N 9°W	N37°W	N 53°W	N16°W
1907	N41°W	N41°W	N45°W	N20°W	N26°W	N 7°W	N 42°E	N 74°E	N 64°E	N 37°W	N 35°W	N 56°W	N21°W
1908	N47°W	N46°W	N 52°W	N21°W	N52°W	N 27°E	N 85°E	N 75°E	N 28°W	N 30°W	N60°W	N52°W	N37°W
1909	N50°W	N51°W	N 38°W	N 76°E	N38°W	N 58°E	N68°W	N 80°E	N38°W	N 72°W	S 80°W	N 57°W	N45°W
1910	N85°W	N75°W	N89°W	N70°W	N 6°W	S 50°E	S 67°E	S 86°E	N 61°E	N42°W	S 77°W	N76°W	N79°W
1911	N69°W	N73°W	N63°W	N62°W	S 43°E	S 25°E	S26°W	S 20°E	S 4°E	S 37°W	S 68°W	S 76°W	S64°W
1912	N67°W	N70°W	N 60°W	N76°W	S 39°E	S 19°E	N 72°E	S 72°E	N 76°W	S 59°W	S 75°W	S 76°W	N84°W
1913	S 84°W	N83°W	N79°W	S58°W	N85°W	S 48°E	S 84°E	S 54°E	S 8°E	N 48°W	S 82°W	S 73°W	S73°W
1914	S 87°W	N88°W	N68°W	S79°W	S 52°E	S 27°E	S 17°E	S 35°E	S 11°E	S 19°W	S 61°W	S 79°W	S44°W
1915	N80°W	N84°W	N61°W	S 3°E	S 75°E	S 42°E	S 48°E	S 36°E	S 54°E	S27°W	S 65°W	N63°W	S34°W
1916	N72°W	N71°W	N82°W	S44°W	S 20°E	S 54°E	S 77°E	S 78°E	S 30°W	S 62°W	S 80°W	S 69°W	S56°W
1917	N74°W	N65°W	N74°W	S35°W	S 9°W	S 25°E	S 30°E	S 37°E	S 11°E	S 44°W	S 78°W	N 84°W	S52°W

Table XI. Amount of precipitation. (in mm.)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	49.1	116.7	33.2	110.7	40.5	210.5	85.5	204.8	252.6	7.5	106.4	124.6	1342.1
1899	17.2	57.0	107.4	56.3	73.4	326.1	235.9	237.4	311.0	206.6	21.1	107.7	1757.1
1900	58.7	74.1	73.9	112.0	87.0	66.5	128.9	55.7	147.5	64.2	101.6	34.7	1004.8
1901	115.8	91.1	105.1	82.0	148.2	96.5	208.5	118.0	167.1	246.2	37.7	109.3	1525.5
1902	5.4	15.5	70.0	109.8	95.9	82.3	187.4	203.1	160.9	105.8	71.6	137.7	1245.4
1903	116.4	29.8	103.5	95.6	138.9	216.9	143.7	64.0	327.3	168.2	63.9	31.5	1499.7
1904	19.5	16.8	110.3	120.3	107.3	62.8	360.8	136.4	329.6	223.0	18.8	33.4	1539.0
1905	110.0	40.1	41.8	131.9	88.2	243.1	61.9	347.7	146.7	142.4	19 8	138.1	1511.7
1906	28.2	171.2	96.1	25.7	42.1	152.5	234.7	77.1	122.7	190.6	17.3	31.6	1189.8
1907	49.8	12.0	70.6	112.8	155.5	124.3	75.8	345.1	131.4	88.0	38.1	28.2	1231.6
1908	44.3	23.5	188.3	114.9	142.5	217.5	83.3	98.5	216.7	28.8	35.0	39.7	1233.0
1909	104.7	36.2	131.7	111.5	169.8	196.5	106.0	116.7	264.1	44.5	25.8	10.7	1318.2
1910	82.7	26.3	46 3	52.7	92.4	164.3	267.5	686.2	219.6	234.6	97.0	48.0	2017.6
1911	61.2	23.0	55.8	151.6	65.0	258.7	353.6	189.6	160.8	104.3	103.4	37.1	1564.1
1912	25.0	111.8	154.9	72.2	77.6	286.9	152.1	139.4	384.0	124.2	32.8	89.8	1650.7
1913	74.5	22.7	29.8	42.6	131.4	201.3	154.9	388.0	115.4	223.4	40.2	87.8	1512.0
1914	36.6	27.6	88.4	268.0	102.7	75.2	170.4	188.9	102.4	168.0	13.4	23.1	1264.7
1915	102.5	214.7	68.2	85.7	157.2	169.7	28.3	165.0	195.6	343.0	7.0	18.3	1555.2
1916	9.6	113.0	20.3	41.3	103.2	143.5	283.3	258.2	325.8	243.2	225.2	26.7	1793.3
1917	20.8	30.6	276.6	52.3	48.2	143.4	31.8	94.5	382.4	332.4	74.5	27.9	1515.4
Mean	56.6	62.7	93.6	97.5	103.4	171.9	167.7	205.7	223.2	164.4	57.5	59.3	1463.5

Table XII. Number of days with precipitation.

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	10	13	7	13	17	17	12	17	19	6	14	18	153
1899	14	13	11	10	13	18	26	22	21	11	11	13	183
1900	15	12	12	15	12	11	14	12	15	13	8	9	148
1901	7	11	12	9	10	13	19	15	18	14	17	15	160
1902	8	7	16	14	14	15	23	23	21	13	11	15	180
1903	15	8	17	15	13	14	22	11	20	15	11	14	175
1904	14	8	15	19	15	14	21	10	16	18	6	14	170
1905	12	8	7	14	16	21	16	25	12	16	10	15	172
1906	13	17	11	12	14	16	24	13	15	16	8	9	168
1907	11	10	16	13	14	11	18	17	18	10	12	11	161
1908	10	8	15	11	15	18	21	17	20	12	12	14	173
1909	15	13	19	9	14	16	14	18	18	10	8	9	163
1910	14	10	7	8	12	16	19	23	18	19	13	12	171
1911	8	8	12	15	10	19	22	19	17	16	14	9	169
1912	9	14	16	9	16	21	20	17	18	12	9	16	177
1913	10	7	9	11	16	13	18	14	12	12	12	16	151
1914	8	9	13	15	11	12	17	15	11	13	8	10	141
1915	11	18	19	12	10	16	8	18	18	15	6	6	157
1916	10	11	9	9	15	15	21	20	20	19	11	10	170
1917	10	11	17	10	13	14	10	13	23	18	12	12	163
Mean	11.2	10.8	13.0	12.2	13.0	15.5	18.3	17.0	17.5	13.9	10.7	12.4	165.3

大正八年二月八日印刷
大正八年二月十三日發行

東京市下谷區茅町二丁目二十六番地
著作兼發行者　佐野理八

東京市芝區三田四國町二番地十七號
印刷人　大瀧由次郎

東京市京橋區宗十郎町十五番地
印刷所　合資會社東京國文社

478647 QC990 J4K3
Kanayama, Japan. Meteorological station.
Résumé of observations made at the ... station.

478647
QC 990
J4 K3
UNIVERSITY OF CALIFORNIA LIBRARY